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MEMORANDUM

Subject: Summary of Power Authority Letters of Intent for Renewable Energy

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Date: October 30, 2001

Since releasing the October 16, 2001 memorandum "Summary of Recent California Contracts and Letters of Intent for Renewable Energy," we have acquired additional information about the letters of intent (LOIs) signed by the California Consumer Power and Conservation Financing Authority (the Power Authority or Authority). Furthermore, the Power Authority has signed two new LOIs for wind and 14 LOIs for biogas since the October 16 memo, bringing total renewable LOIs to 1956 MW. The purpose of this memorandum is to summarize these latest developments.[1] As one of the largest samples of publicly available renewable energy contract information in the United States, we expect you may find this information valuable.

Wind Power

Table 1 summarizes the LOIs for wind power signed to date. Points worth noting include:

- ***Contract Terms***: As a reminder, the Power Authority intends to enter into contracts with wind generators that will: (1) sell their electrical output to the Power Authority for 10 years, and (2) in year 11 provide the Power Authority the option to purchase the facility outright. This structure intends to maximize the value of federal tax incentives while still maintaining a Power Authority ownership option in later years.

- ***New LOIs:*** The two new LOIs for wind signed since the last memo are both for 200 MW projects developed by Cannon Energy Corporation, one coming on line in June 2003 and the other in June 2004, but otherwise with identical terms. These two contracts run contrary to the Authority's stated preference for power that can come on line by the summer of 2002,

[1] Note that this memorandum does not discuss DWR contracts for renewable energy (see the October 16 memo for this information).

and suggest that perhaps the price ($39.9/MWh over 15 years) and size (200 MW each) of the projects were countervailing factors.

- ***Turbine Selection:*** Enron Wind could see a large influx of turbine orders. Though technology specifications are only preliminary, and several of the LOIs explicitly reserve the right to substitute technology of similar caliber, 1,022 MW out of 1,727.5 MW of wind LOIs specify turbines manufactured only by Enron Wind, while another 500 MW specify either Enron Wind or Vestas turbines. Only 3 of the 17 projects, representing a total of 205 MW, do not list Enron Wind turbines as possible technology.

- ***Project Location***: The 17 projects are clustered at six sites. Tehachapi will gain 670 MW, followed by 400 MW (the two new Cannon projects) at a new site in San Diego County, 250 MW in Solano County, 206 MW at San Gorgonio, 149 MW at Altamont Pass, and a single 53 MW project located at Cape Blanco, Oregon.

- ***Land Lease Terms:*** Three of the LOIs specify land lease terms, which range from 4% to 7.5% of project gross revenue. This equates to between roughly $8,000 to $16,000 per turbine per year to the landowner, given the capacity factors and turbine sizes indicated. These numbers are higher than the often-cited figures of 2% to 3% of gross revenue or $2,000 to $3,000 per turbine per year, perhaps due to both the relatively limited number of good wind sites in California compared to other parts of the country such as the Midwest, as well as California's longer experience with wind power, both of which strengthen the bargaining position of the landowner.

- ***Capacity Factors:*** Projected capacity factors range from 28% to 39%, with a capacity-weighted average of 34.6% (not counting the enXco or SeaWest projects, which did not provide capacity factor estimates).

- ***Contract Price:*** During the 10-year contract term, the capacity-weighted average energy price is $45.1/MWh for all 17 LOIs, and $47.5/MWh for those projects (623.5 MW) recommended for contracting to date. Only one LOI (SeaWest) proposes to escalate the energy price. All other prices remain constant on a nominal basis for the 10-year contract term.

- ***PTC Treatment***: While only 5 of the 17 LOIs specifically state that the quoted energy price assumes the presence of the federal production tax credit (PTC), we assume that all of the proposals assume the PTC in their pricing, simply because of the way in which the Power Authority requested proposals – a 10-year power purchase agreement (PPA) with an option to buy the facility in year 11. Only the Pacificorp LOI states prices both with ($43/MWh) and without ($63/MWh) the PTC, implying that the PTC is worth $20/MWh to a developer over a 10-year period. This equates to a 1.44¢/kWh difference over 20 years, assuming a 10% discount rate.

- ***Interconnection Costs:*** All projects include interconnection costs as part of the quoted energy price, with the exception of two FP&L projects. FP&L will assess several different

interconnection and transmission options for these two projects, allow the Power Authority to choose among them, and then build the costs into the indicated price.

- ***Project Debt Term:*** Four of the LOIs (the three Cannon projects and Southern Sierra Power) specify a 15-year PPA term (instead of 10-year), and state that if the Power Authority exercises the option to purchase the facility in year 11, it must also assume the project's debt, which presumably would not span more than an additional 5 years (i.e., not more than the 15-year debt).

- ***Option to Purchase Facility:*** Facility purchase prices (an option that exists in year 11 of the contracts) range from $463/kW to $1542/kW (not including the four proposed 15-year projects mentioned in the previous bullet that would require the Authority to assume debt). This wide range indicates that project owners either have widely divergent views as to what revenues their projects will earn from year 11 on, or are not simply discounting their expected cash flows from year 11 through the life of the project to arrive at the sale price.[2] In California, the most valuable piece of a project in year 11 may be the site itself, which could explain some of the higher values.

- ***25-year Contract Price Equivalent:*** Analysts and policymakers alike always question what renewable energy costs over the life of a project. The information embodied in these LOIs provides a wealth of useful information in this regard. In order to get a sense of what wind power in California would cost if purchased over a longer time period than the 10-years for which we have data, we assumed that a developer would be able to sell the plant's output in year 11 at 3.0¢/kWh, escalating at a 2.3% rate of inflation for the next 15 years (i.e., 25-year project life).[3] If anything, we expect that this may be an overestimate of wind developers' expectations; in developing the proposed 10-year LOI price, wind developers presumably considered a worst-case outcome for power sales revenue after year 11 (a developer cannot count on the facility sales option being exercised by the Power Authority). Our results are therefore more likely to be biased upwards than downwards. Discounting (at a 10% discount rate) a 25-year price stream that consists of each project's actual PPA price for the first 10 years, combined with the escalating 3.0¢/kWh stream in years 11 through 25, yields a range of 25-year levelized nominal wind prices from 3.8¢/kWh to 4.5¢/kWh, with a weighted average of 4.3¢/kWh. In real terms, this is equivalent to a range of 3.2¢/kWh to 3.7¢/kWh, with a weighted average price of 3.6¢/kWh.

[2] Converting the purchase price into an expected income stream that would escalate with inflation from year 11 through the life of the project yields a range of expected year 11 prices from 4.0¢/kWh to 9.5¢/kWh, assuming a 10% discount rate (the capacity weighted average price is 5.1¢/kWh). These numbers are obviously higher than what one would expect from a prudent worst-case analysis, implying that developers have built other factors into their price.

[3] Note that 3.0¢/kWh is below the bottom of the range of prices discussed in the previous footnote.

Table 1. Summary of Power Authority LOIs for Wind Power

Project Developer	Project Location	Online Date	Planned Technology	Capacity (MW)	Capacity Factor	Energy Price ($/MWh)[4]	Price Includes Interconnection?
Pacificorp Power Marketing	Solano and/or Alameda County	6/1/2002	Vestas or Enron	100	33%	43	Undisclosed
Clipper Windpower, LLC	Cape Blanco, OR	6/1/2002	Enron 1.5 MW	52.5	33%	46.3	Yes
Clipper Windpower, LLC	Altamont Pass	7/1/2002	Enron 1.5 MW	100.5	30%	49.57	Yes
enXco	Altamont Pass	6/1/2002	Enron 900 kW	30.6	N/A	50	Yes
enXco	Altamont Pass	6/1/2002	Enron 900 kW	18	N/A	50	Yes
Cannon Energy Corporation	Morongo Res., near Cabazon	8/1/2002	Enron 1.5 MW	100	36%	39.9 for 15 years	Yes
Cannon Energy Corporation	Near Cuyapaipe Res., San Diego County	6/1/2003	Enron 1.5 MW or Vestas 660 kW	200	36%	39.9 for 15 years	Yes
Cannon Energy Corporation	Near Cuyapaipe Res., San Diego County	6/1/2004	Enron 1.5 MW or Vestas 660 kW	200	36%	39.9 for 15 years	Yes
Windridge, LLC (FP&L)	Mojave	April-June 2002	Vestas 660 kW	60	39%	40	No
Clipper Windpower, LCC	Riverside County	6/1/2002	Enron 1.5 MW	37.5	38%	43.13	Yes
CTV Marketing Group, LTD	Tehachapi	6/30/2002	Vestas 2 MW	50.4	35%	44.5 for 15 years	Yes
High Winds LLC (FP&L)	Birds Landing, Solano County	Aug-Nov 2002	Micon 900 kW (60 MW), Enron 1.5 MW (90 MW)	150	39%	44.5	Yes
Southern Sierra Power (FP&L)	Southern Sierras	April-Nov 2002	Enron 1.5 MW	200	39%	47.5	No
Enron Wind Development	Palm Springs	6/30/2002	Enron 1.5 MW	33	34%	48.9	Undisclosed
SeaWest Windpower, Inc.	San Gorgonio	Nov-Dec 2002	Mitsubishi	35	N/A	49.5	Yes
Enron Wind Development	Rudnick, Kern Co.	6/30/2002	Enron 1.5 MW	300	28%	49.9	Yes
enXco	Kern County	6/1/2002	Enron 1.5 MW	60	N/A	50	Yes

[4] All energy prices are fixed for a 10-year term, except for (a) the SeaWest project, which proposes to escalate the price at the rate of inflation and (b) all three Cannon Energy Corporation projects and the CTV Marketing Group project, which have proposed 15-year contracts. Should the Power Authority decide to purchase these four latter projects in year 11, it would be required (at least under the letter of intent) to take on the project's remaining debt, which would presumably not span more than another 5 years.

Table 1 (continued). Summary of Power Authority LOIs for Wind Power

Project Developer	Facility Purchase Price	Assumption of Debt	Facility Purchase Price (including debt)	Site Control
Pacificorp Power Marketing	$75,000,000	$0	$750/kW	Leased for a minimum of 25 years.
Clipper Windpower, LLC	$47,250,000	$0	$900/kW	4% of gross revenues for 30 years (~$8,000/turbine/year).
Clipper Windpower, LLC	$90,450,000	$0	$900/kW	5% of gross revenues for 30 years (~$9,800/turbine/year).
EnXco	$47,177,139	$0	$1,542/kW	Leased.
EnXco	$26,745,704	$0	$1,486/kW	Leased.
Cannon Energy Corp.	$10,000,000	$27,000,000	$370/kW	20-year lease.
Cannon Energy Corp.	$20,000,000	$54,000,000	$370/kW	25-year lease.
Cannon Energy Corp.	$20,000,000	$54,000,000	$370/kW	25-year lease.
Windridge, LLC (FP&L)	$35,300,000	$0	$588/kW	3 land leases, ranging from 30 to 60 years. No option to purchase the land.
Clipper Windpower, LCC	$33,750,000	$0	$900/kW	7.5% of gross revenues for 30 years (~$16,200/turbine/year).
CTV Marketing Group, LTD	$5,000,000	$15,000,000	$397/kW	Leased.
High Winds LLC (FP&L)	$80,500,000	$0	$537/kW	6 land leases, each with 45-year term. No option to purchase the land.
Southern Sierra Power (FP&L)	$136,300,000	$0	$682/kW	2 land leases, with term ranging from 22 to 32 years. No option to purchase the land.
Enron Wind Development	$17,100,000	$0	$518/kW	30-year lease.
SeaWest Windpower, Inc.	Undisclosed	Undisclosed	Undisclosed	Majority of land owned by developer, small portion leased for 20-year life of project.
Enron Wind Development	$139,000,000	$0	$463/kW	20-year lease.
enXco	$53,262,361	$0	$888/kW	Leased.

Landfill Gas

To date, the Power Authority has signed two LOIs for a total of 3.4 MW of landfill gas. Ridgewood Olinda LLC has secured an LOI for a 2.4 MW plant located in the city of Brea, the output of which is offered to the Power Authority at $59.99/MWh (escalating at the CPI starting in the 2nd year) for 10 years, after which the Authority has one year to exercise an option to purchase the facility for $4 million. The Monterey Regional Waste Management District (MRWMD) is offering the output of a 1 MW facility located in Marina to the Authority at $65/MWh (term not specified, but 8,760 hours per year), with no option to buy the facility. MRWMD gets a bonus equal to 5% of actual construction costs if the project is on line before June 1, 2002, and is penalized the same amount if the project comes on line after August 1, 2002.

Table 2. Power Authority LOIs for Landfill Gas

Project Developer	Energy Cost ($/MWh)	Escalation	Bonus/ Penalty	Hours Per year	Facility Purchase Price	Expected On Line
Ridgewood Olinda LLC	59.99	CPI, starting in year 2	N/A	Not specified	$4,000,000 ($1,667/kW) in year 11	01/02/02
Monterey Regional Waste Management District	65.00	None	5% of actual costs: bonus before 6/01/02, penalty after 8/01/02	8,760	Not for sale	12/15/01

Biofuels (i.e., biodiesel)

The Power Authority has signed letters of intent with two developers to purchase four projects using biofuels (often called biodiesel). Each project is 49.9 MW, and each developer's pair of projects is more or less identical, perhaps implying that the projects were split up in this manner to bypass CEC siting requirements for projects over 50 MW.

Far West Energy:
These two 49.9 MW projects consist of reciprocating engine generators fueled by a combination of 80% natural gas and 20% biofuel (a ratio that calls into question why these plants are categorized as "renewable"). Each is offered to the Power Authority at a price of $581/kW ($29,000,000), though Far West gets a bonus equal to 5% of actual construction costs if the project is on line before June 1, 2002, and is penalized the same amount if the project comes on line after August 1, 2002. Each plant is guaranteed at full nameplate capacity and has a guaranteed heat rate of 10,500 Btu/kWh. One of the projects is required to obtain permits sufficient to operate for up to 1,900 hours/year, while the other must plan for up to 6,000 hours/year.

Sierra Industrial Group:
One of the more bizarre projects before the Power Authority, the Locomotive Emission Reduction Project consists of 48 General Electric locomotives located on the Sierra Railroad and fueled by 100% biofuel (biodiesel). Locomotive emissions are not currently regulated by the state, but the Sierra Railroad Company has been investigating different ways to voluntarily reduce emissions. In order to test emissions levels using various technologies, however, the locomotives need to be stationary, and until now, the power generated during testing (up to 2.1 MW per locomotive) has simply been dissipated as waste heat. Sierra Industrial Group proposes to install commercially available inverters and mobile transformers to feed utility-grade power into the grid at peak times, up to 1000 hours per year.[5] Each of the two 49.9 MW projects (24 locomotives each) is offered to the state at a price of $28,443,000 ($570/kW), though the developer gets a bonus equal to 5% of actual construction costs if the project is on line before June 1, 2002, and is penalized the same amount if the project comes on line after August 1, 2002. The developer has offered to operate the facility over a 5-year period under a separate O&M and fuel agreement, and will offset 100% of emissions from these projects by converting additional locomotives to biofuel and installing emissions reduction technology.

Table 3. Power Authority LOIs for BioFuels

Project Developer	Capacity (MW)	Hours Per Year	Facility Purchase Price ($/kW)	$/kW-yr[6]	Fuel
Far West Energy	49.9	6000	$581	69	80% natural gas, 20% biofuel
	49.9	1900	$581	69	80% natural gas, 20% biofuel
Sierra Industrial Group	49.9	1000	$570	73	100% Biofuel
	49.9	1000	$570	73	100% Biofuel

Biogas

The Authority has recently signed LOIs with 14 biogas plants totaling 26 MW and sited at dairies near Fresno in the Central Valley. These cogeneration plants will feature anaerobic digestion of cow manure, which offers the ancillary environmental benefits of reducing buildup of animal waste and improving air and water quality. All 14 plants will be developed by Microgy Cogeneration Systems, Inc. and offered to the Power Authority as a 10-year power purchase agreement with an option to purchase the facility in year 11. All have the same proposed PPA terms: $88/MWh for peak periods (defined as 16 hours/day for 5 days/week) and $43/MWh for off-peak periods (defined as 16 hours/day for 2 days/week, presumably weekends), for a weighted average price of $75/MWh. The year-11 facility purchase price varies by plant size, which ranges from 1 to 5.3 MW: the 10 plants that are less than 2 MW will cost $1,500/kW in year 11, the 3 plants between 2 and 3 MW will cost $1,300/kW, and the single plant over 5 MW will cost $1,100/kW (alternatively, the parties may opt for a fair market

[5] The locomotives can be relocated with minimal notice to almost anywhere in the state (with a rail line), to accommodate system needs.
[6] These numbers are not contained in the LOIs, but rather are taken from the Power Authority's web site, and reflect the Authority's estimates of the total cost of ownership, including financing and fixed O&M costs.

valuation by a mutually agreeable third party appraiser). All 14 plants guarantee an 85% capacity factor, bringing total guaranteed capacity to 22.1 MW, and all are expected to come on line in the third quarter of 2002.

Table 4. Power Authority LOIs for Biogas

Project Developer	Capacity (MW)	Location	Energy Cost	Purchase Price	Guaranteed Capacity Factor	Expected Online Date
Microgy Cogeneration Systems, Inc.	1.4	Lemoore	$88/MWh peak (16 hours/day, 5 days/week) $43/MWh off-peak (16 hours/day, 2 days/week)	$1,500	85%	Third quarter of 2002
	1.2	Hanford		$1,500		
	1.8	Lemoore		$1,500		
	1.5	Corcoran		$1,500		
	1.0	Hanford		$1,500		
	1.6	Firebaugh		$1,500		
	2.2	Burrel		$1,300		
	1.8	Burrel		$1,500		
	1.4	Hilmar		$1,500		
	2.2	Hilmar		$1,300		
	5.3	Chowchilla		$1,100		
	1.0	Hilmar		$1,500		
	1.2	Los Banos		$1,500		
	2.4	Tulare		$1,300		

Political Troubles

While the Power Authority has increased the number of LOIs for renewable energy projects in recent weeks, and has even announced its intention to enter into contracts with up to 623.5 MW of wind power, as well as a 181 MW gas-fired peaking plant and a demand reduction program, all is not well at the Power Authority. The CPUC's rejection of the rate agreement that would have allowed the DWR to recover power costs through electricity rates and the state to issue up to $12.5 billion in bonds has called into question the creditworthiness of the DWR. And since the Power Authority has planned to sell most or all of its power to the DWR, its fate is directly tied to that of the DWR – until the DWR is deemed creditworthy, it appears as if the Power Authority will not be able to enter into contracts for power or power plants. Likewise, all of the wind developers negotiating with the Power Authority are seeking project financing, and have indicated that they will be unable to secure financing to build their projects until the DWR is assigned a favorable credit rating with which lenders are comfortable.

In addition to this roadblock, the Power Authority is facing other political problems. *California Energy Markets* reports that the Joint Legislative Audit Committee of the state legislature is investigating whether the Authority is upholding the spirit of SBX2-6, the Authority's enabling legislation. There are also indications that the DWR may not be willing to purchase the peaking power that the Authority has lined up, and that the CEC is uncomfortable with the Power Authority's siting plans.

Given these problems, it is difficult to say whether or how the LOIs presented here will progress into actual contracts. Nevertheless, the information contained within the LOIs alone is valuable in and of itself – never before has such detailed information on the costs of renewable energy in California been so readily available.